

What is claimed is:

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1. A single wafer type substrate cleaning method of wet-cleaning wafers which are not stored in a cassette, individually, in a sealed cleaning housing, said method consisting of the application of a spin drying treatment to the face of each wafer by supporting and rotating each wafer at high speed in the sealed cleaning housing while an inert gas for preventing oxidation is supplied to the face of the wafer in a drying step, where the amount of inert gas to be supplied to the face of each wafer is such that the amount of inert gas supplied at the outer peripheral portion is larger than that at the center thereof.

2. The single wafer type substrate cleaning method according to Claim 1, wherein a sealed drying space is formed at the outer peripheral portion of the face of the wafer and the inert gas is supplied to the inside of the sealed drying space so that the space is filled with inert gas.

3. The single wafer type substrate cleaning method according to Claim 1, wherein the inert gas employed is a nitrogen gas.

4. A single wafer type substrate cleaning apparatus for cleaning wafers, which are not stored in a cassette, one by one in a sealed cleaning housing, said apparatus comprising of:

a wafer rotary means for supporting and rotating a single wafer in the cleaning housing in the horizontal position;

a cleaning chamber provided at the outer peripheral

portion of the wafer rotary means for forming a cleaning treatment space for cleaning each wafer which is rotatably supported by the wafer rotary means;

a chemical fluid supply means for supplying cleaning fluid(s) to the face of the wafer which is rotatably supported by the wafer rotary means; and

an inert gas supply means for supplying inert gas to prevent oxidation on the face of the wafer which is rotatably supported by the wafer rotary means;

wherein the number of supply ports of the inert gas supply means is such that the number of supply ports at the outer peripheral portion of the face of the wafer is larger than that at the center thereof.

5. The single wafer type substrate cleaning apparatus according to Claim 4, wherein the inert gas supply means has a gas injection section consisting of a circular cover body for forming the sealed drying space at the outer peripheral portion of the face of the wafer which is rotatably supported by the wafer rotary means while cooperating with the cleaning chamber, wherein the gas injection section comprises a flat hollow body which communicates with an inert gas supply source at the inside thereof and has the supply ports at the plane bottom portion.

6. The single wafer type substrate cleaning apparatus according to Claim 5, whereby the supply ports of the gas injection section comprise a plurality of injection openings which are disposed radially and arranged concentrically with the face of the wafer, and the sum of the areas of openings of

these injection openings is determined to be larger at the outer peripheral portion of the face of the wafer than that at the center thereof as the injection openings direct toward the outer peripheral portion of each wafer.

7. The single wafer type substrate cleaning apparatus according to Claim 6, wherein the area of the injection openings is determined to be larger at the outer region of the face of the wafer than at the center thereof as the injection openings direct toward the outer region of the wafer.

8. The single wafer type substrate cleaning apparatus according to Claim 6, wherein the number of disposition of the injection openings is determined to be larger at the outer region of the face of the wafer than at the center thereof as the injection openings direct toward the outer peripheral portion of the wafer.

9. The single wafer type substrate cleaning apparatus according to Claim 6, further comprising a baffle plate which is interposed in the hollow section of the gas injection section for preventing the inert gas from directly flowing to the central portions of the supply ports of the inert gas.

10. The single wafer type substrate cleaning apparatus according to any of Claims 5 to 9, wherein the gas injection section is movable between a use position where it cooperates with the cleaning chamber and a standby position where it does not interfere with the chemical fluid supply means.

11. The single wafer type substrate cleaning apparatus according to any of Claims 4 to 10, wherein the cleaning chamber

is movable up and down relative to the wafer rotary means, and the plural stages of the annular cleaning baths forming the cleaning treatment space are arranged vertically in and concentrically with the inner peripheral portion of the cleaning chamber so as to surround the wafer supported by the wafer rotary means, and where depending on the cleaning treatment step to be employed, one of the circular treatment baths is accordingly moved to a position corresponding to the wafer supported by the wafer rotary means when the cleaning chamber is moved up and down.

12. The single wafer type substrate cleaning apparatus according to any of Claims 4 to 11, wherein the cleaning chamber is designed in such a manner that the inner peripheral portion of each annular treatment bath does not contact the outer periphery of the wafer supporting section of the wafer rotary means, and the annular gap defined between these edges is at very small intervals to prevent chemical fluids and purified water from being leaked downward.

13. The single wafer type substrate cleaning apparatus according to any of Claims 4 to 12, wherein the chemical fluid supply section consists of injection nozzles for injecting and supplying cleaning fluid to the face of each wafer which is supported by the wafer rotary means from above, and the injection nozzles are provided to be horizontally turnable while directed downward, and inject and supply the cleaning fluid to the face of each wafer which is rotatably supported by the wafer rotary means while it is turned horizontally from

the outer peripheral portion toward the center thereof or in standstill position as it is horizontally turned.

Q 14. The single wafer type substrate cleaning apparatus according to any of Claims 4 to 13, wherein the inert gas is a nitrogen gas.

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